General Mathematics 2019 v1.2

Unit 1 Topic 1 high-level annotated sample response

July 2020

Problem-solving and modelling task

This sample has been compiled by the QCAA to assist and support teachers to match evidence in student responses to the characteristics described in the assessment objectives.

Assessment objectives

This assessment instrument is used to determine student achievement in the following objectives:

1. select, recall and use facts, rules, definitions and procedures drawn from Unit 1 Topic 1
2. comprehend mathematical concepts and techniques drawn from Unit 1 Topic 1
3. communicate using mathematical, statistical and everyday language and conventions
4. evaluate the reasonableness of solutions
5. justify procedures and decisions by explaining mathematical reasoning
6. solve problems by applying mathematical concepts and techniques drawn from Unit 1 Topic 1.

Queensland Government | Queensland Curriculum & Assessment Authority

For all Queensland schools

200721

Task

Context
In 2020, Tokyo will host the sixteenth Summer Paralympic Games. A significant number of people will travel to the games to support their country's athletes. These people need to understand the financial requirements of such a trip, including fixed and discretionary spending, in order to develop a personal budget based on their income.
Task
Investigate the financial requirements of a person aiming to travel from Australia to the Tokyo Paralympic Games in 2020 to support the Australian team. Produce a personal budget based on the results of your mathematical research, then refine the model to ensure they can afford to attend. You are to assume that the supporter: • has a part-time job • is entitled to government disability support • will attend at least four different Olympic events. You must use: • the approach to problem-solving and mathematical modelling provided • different data to other students in your class and school. You will have four weeks to complete the assessment, including three hours of class time.

Sample response

Criterion	Marks allocated	Result
Formulate Assessment objectives 1, 2, 5		
Solve Assessment objectives 1, 6		
Evaluate and verify Assessment objectives 4, 5		
Communicate Assessment objective 3		
Total		

Table of contents

1 Introduction

Communicate coherent and concise organisation, appropriate to the genre

Formulate accurate translation of all aspects of the problem by identifying mathematical concepts and techniques

The aim of this report is to investigate the financial requirements for a person saving to be a spectator at the next Paralympic Games, which will be held in Tokyo, Japan from 25 August to 6 September 2020 (Disabled World 2017).

To create a personal budget for the person to ensure they can attend the Paralympics, I will investigate suitable **government allowances** available to them and then create a **weekly budget using a spreadsheet program**. The budget will be used to save for the trip. The total amount of money required will need to include:

- airfares**, including increases due to inflation** (using the **compound interest formula**)
- accommodation
- travel insurance
- spending money for entertainment and extra meals.

Once I have calculated the amount of money in Australian dollars, this amount will need to be **converted into Japanese yen**. For this calculation, I will observe the conversion rate once a week for the next three weeks and **use the mean**.

Note: The mathematical concepts I will use to investigate this problem are shown in bold type above.

2 Initial Considerations – Observations and Assumptions

Formulate accurate documentation of relevant observations

documentation of appropriate assumptions

1. The task states that the supporter is entitled to government disability support and has a part-time job. Looking at the available support online it would seem that the 'Disability Support Pension' is the most appropriate (Department of Human Services 2017a) with a base rate of $808.30 each fortnight.
2. The task also states that the supporter has a part-time job. I will assume that the supporter earns the maximum fortnightly amount that will not affect their Disability Support Pension. Therefore, they will earn $164 (Department of Human Services 2017b) each fortnight from a part-time job.
3. The cost of airfares can vary significantly. Looking at various websites it seems that buying tickets well in advance and for non-direct flights are cheaper. Therefore, the tickets chosen for this investigation will be the cheapest available bought well in advance.
4. Exchange rates change daily, so it is important to look for the best rates. For this investigation I have used an exchange rate of 1 AUD = 86.8739 JPY found in Appendix 3 at www.xe.com/currencyconverter/convert/?Amount=1&From=AUD&To=JPY
5. I have assumed that the person lives in Brisbane, already has a passport and is 21.

6. Travel insurance needs to be taken out for the trip. I will assume no major injury occurs outside stipulated health insurance conditions on the trip, as this could cause extra unexpected expenses.
7. The person plans to see four different events, which will be held at a variety of venues in Tokyo. The maximum price is expected to be 6000 Yen per ticket, so I will assume that all 4 tickets are the maximum expected price.
8. For budgeting the regular expenses are estimates based on averaging information sourced from family and friends.

3 Developing the budget

3.1 Income

3.1.1 Government allowances

Communicate correct use of technical vocabulary to develop the response

The government allowance available for this person is a Disability Support Pension (Department of Human Services 2017a). Government payments also available for someone receiving a pension are the pension supplement, energy supplement and rent assistance.

Formulate accurate documentation of relevant observations

$808.30 pension basic rate

+ $65.90 pension supplement

+ $14.10 energy supplement

Communicate coherent and concise organisation of the response, which can be read independently of the task

+ $130.60 rent assistance

= $1018.90/fortnight

Total government allowances per fortnight: $1018.90

3.1.2 Part-time job

Formulate accurate documentation of relevant observations

The person can earn up to $164 per fortnight without affecting their pension. If they earn more than this amount, their pension will be reduced by 50 cents for each dollar over $164 (Department of Human Services 2017b).

documentation of appropriate assumptions

The person will work part-time at their local corner shop at a rate of $19.44/hour (Fair Work Ombudsman 2017). They want to work the maximum number of hours without affecting their pension.

Solve application of mathematical concepts and techniques relevant to the task

Maximum allowable hours

$$\frac{\$164}{\$19.44/\text{hr}} = 8.4362 \text{ hours/fortnight}$$

Therefore, they will work eight hours (rounded down to nearest hour) per fortnight, or four hours per week.

3.1.3 Total income

Communicate coherent and concise organisation of the response, which can be read independently of the task

Part-time job income: $8 \times \$19.44 = \$155.52$/fortnight

Total fortnightly income: $\$1018.90 + \$155.52 = \$1174.42$/fortnight

3.2 Expenses

3.2.1 Airfares

Formulate accurate documentation of relevant observations

Flights cannot be booked three years in advance, so I looked at fares for 24 August to 7 September 2017 and applied increases according to inflation to estimate the future costs. I used a flight comparison website and found 383 flight options. The best return price was $924 with Thai Airways; however, flights were over 32 hours each way and arrived very late at night. The most expensive return flights were with British Airways at $9702, and did not leave either country on the correct days. Most flights had at least one stopover.

I decided on a Singapore Airlines return flight because it is about 20 hours each way. The flights stop in Singapore and cost only $1060.95 in total.

3.2.2 Travel insurance

Travel insurance of $116.13 covers overseas emergency assistance, medical and hospital coverage, cancellation and luggage protection.

3.2.3 Airfares, travel insurance and Paralympic tickets (see Appendix 1)

Paralympic tickets

$$\begin{aligned}\text{Event ticket cost} &= 6\,000 \text{ Yen} \times 4 \\ &= 24\,000 \text{ Yen} \\ &= 24\,000 \div 86.8739 \text{ AUD} \\ &= \$276.26\end{aligned}$$

Total upfront expenses

$$\begin{aligned}\text{Airfares} + \text{travel insurance} + \text{event ticket cost} &= \$1060.95 + \$116.13 + \$276.26 \\ &= \$1453.34\end{aligned}$$

Increase due to inflation

Solve application of mathematical concepts and techniques

Communicate correct use of appropriate procedural vocabulary to develop the response

These costs are likely to increase over the next three years due to inflation, so I will calculate the future increased cost. The Australian annual inflation rate fluctuates (Rate Inflation 2017). I calculated the mean of the rate from 2012 to 2016.

$$\frac{1.3 + 1.5 + 2.5 + 2.5 + 1.7}{5} = 1.9$$

The average inflation rate was 1.9% over the past five years.

Using the 2017 airfare, travel insurance and event ticket cost of $\$1453.34$ and applying an increase in price of 1.9% due to inflation will find the predicted cost in 2020.

Solve
application of mathematical concepts and techniques relevant to the task

Communicate
coherent and concise organisation of the response, which can be read independently of the task

Formulate
accurate documentation of relevant observations

Evaluate and verify
justification of decisions made using mathematical reasoning

Predicted cost in 2020

$$A = P\left(1 + \frac{i}{100}\right)^n$$

$$A = 1453.34 \times 1.019^3 = \$1537.76$$

I rounded this amount to $1550, which I will use for my budget calculations.

3.2.4 Accommodation and food

Using the *Homestay* website, www.homestay.com, I found accommodation starting at $20/night. There was one in a good location for $63/night, including home-cooked meals (see Appendix 6).

As 2020 prices are not available at this point, I will budget for $200/day, which will allow for eating out as well as some home cooked meals at the homestay accommodation.

Accommodation at Homestay and some eating out for 11 days (24 August. to 7 September):

$$14 \times 200 = 2800$$

Total accommodation cost: $2800.

3.2.5 Extra spending money

Solve
simplistic application of mathematical concepts and techniques relevant to the task

The spectator will need to travel between their accommodation and the sporting venues. They will also want to see the sights and attractions of Tokyo, so extra spending money of $100/day for 14 days will also be budgeted for.

$$14 \times 100 = 1400$$

Total spending money required: $1400.

3.2.6 Foreign currency exchange

Communication
correct use of appropriate technical vocabulary, procedural vocabulary and conventions to develop the response

Spending money of $1400 needs to be converted to Japanese yen. The exchange rate changes daily, so it would be best for the person to check the exchange rate regularly and exchange cash when the rate is favourable.

Once the amount of spending money in Australian dollars has been calculated, this will need to be converted into Japanese yen. I have used an online calculator to estimate what the exchange rate will be (see Appendix 3).

Exchanging Australian dollars for Japanese yen

$$1400 \times 86.8739 = 121\,623.46$$

When they convert their $1400 into Yen, they will have ¥121 623.46.

4 Budget summary

A budget needs to be prepared that includes:

- person's regular income
- person's regular expenses
- savings required for the Paralympics trip.

4.1 Regular income

The person's regular income is $1174.42/fortnight from government allowances and their part-time job. See section 3.1.

4.2 Regular expenses

The person's regular expenses include food, electricity, health insurance, rent, entertainment and necessities such as clothing and shoes. Estimated values are given in the spreadsheet below based on research online and comparing with family and friends.

Solve
accurate and appropriate use of technology; accurate use of complex procedures to reach a valid solution
The solution consists of an involved combination of parts that are connected.

$= B15 * 2 * 1.15$

=130*(52/12)*12*1.05

Solve
application of mathematical concepts and techniques relevant to the task

Unit 1 Budget PSMT

Solve

Years 2017 - 2020	Half year July-Dec 2017	Whole year Jan-Dec 2018	Whole year Jan-Dec2019	Half year Jan-June 2020	Total
Income					
Income - no tax (increasing by 3%p.a.)	$ 15,267.46	$ 31,450.97	$ 32,394.50	$ 16,683.17	**$ 95,796.09**
Expenses					
Food ($130/w, increasing by 5% annually)	$ 3,380.00	$ 7,098.00	$ 7,807.80	$ 4,294.29	**$ 22,580.09**
Electricity ($580/quarter, up 10% p.a.)	$ 1,160.00	$ 2,552.00	$ 2,807.20	$ 1,543.96	**$ 8,063.16**
Biannual Insurance ($310, up 10% pa)	$ 310.00	$ 682.00	$ 750.20	$ 412.61	**$ 2,154.81**
Rent Payments ($350/week, up by 5% p.a.)	$ 9,100.00	$ 19,110.00	$ 21,021.00	$ 11,561.55	**$ 60,792.55**
Car Loan Payments ($120/week, constant)	$ 3,120.00	$ 6,240.00	$ 6,240.00	$ 3,120.00	**$ 18,720.00**
Clothing/Shoes ($150/m, up 10% p.a.)	$ 900.00	$ 1,980.00	$ 2,178.00	$ 1,197.90	**$ 6,255.90**
Entertainment ($220/w, constant)	$ 5,720.00	$ 11,440.00	$ 11,440.00	$ 5,720.00	**$ 34,320.00**
Medical Expenses ($80/w, up 15% p.a.)	$ 2,080.00	$ 4,784.00	$ 5,501.60	$ 3,163.42	**$ 15,529.02**
Petrol ($40/week, increasing by 5% p.a.)	$ 1,040.00	$ 2,184.00	$ 2,293.20	$ 1,203.93	**$ 6,721.13**
Car Servicing ($120, twice a year, constant)	$ 120.00	$ 240.00	$ 240.00	$ 120.00	**$ 720.00**
Telephone Bill ($50/m 2yr plan, $60/m 2yr)	$ 300.00	$ 600.00	$ 720.00	$ 360.00	**$ 1,980.00**
Miscellaneous ($50/week, constant)	$ 1,300.00	$ 2,600.00	$ 2,600.00	$ 1,300.00	**$ 7,800.00**
Total Expenses	$ 28,530.00	$ 59,510.00	$ 63,599.00	$ 33,997.66	**$ 185,636.66**
Bank Balance (Start of Year)	$ 20.00	-$ 13,242.54	-$ 41,301.57	-$ 72,506.08	
Surplus/Deficit	-$ 13,262.54	-$ 28,059.03	-$ 31,204.50	-$ 17,314.49	**-$ 89,840.57**
Bank Balance (End of Year)	-$ 13,242.54	-$ 41,301.57	-$ 72,506.08	-$ 89,820.57	
Savings	-$ 13,242.54	-$ 41,301.57	-$ 72,506.08	-$ 89,820.57	**-$ 89,820.57**
Percentage of Income	-87%	-89%	-96%	-104%	**-94%**

See Appendix 5 for budget spreadsheet calculations.

4.3 Savings needed for Paralympics

$1550 (airfares, travel insurance and event tickets)

+ $2800 (accommodation, including food, at the Olympic Village)

+ $1400 (spending money — to be converted to Japanese yen)

= $5750 total money required for trip.

5 Evaluating the budget

Communicate correct use of procedural vocabulary to develop the response

Can the person afford to attend as a spectator at the Paralympic Games? Using the budget in Section 4.2 to save for expenses helps plan for the trip. However, this is not the best solution as, according to the budget calculations, the spectator is living beyond their means and cannot afford to go to the Paralympic Games given these initial calculations and budget.

Evaluate and verify documentation of relevant strengths and limitations of the solution

5.1 Strengths and limitations

The strengths of the original model are that it covered income from available government allowances and a part-time job and a weekly budget to save for the trip was then developed. The total cost required included:

- the cost of airfares, including increases due to inflation
- accommodation
- travel insurance
- spending money for entertainment and extra meals.

The limitation of the original model, that the person cannot afford to go to the Paralympics, can be overcome with lifestyle changes that will help build further savings.

5.2 Further savings

Changes in the new budget:

Evaluate and verify documentation of relevant strengths and limitations of the solution

Reduce spending on clothing and shoes by 50%.

Reduce spending on the telephone bill by remaining on a $50/month phone plan instead of upgrading to the $60/month plan.

Move out of the rented house and into a boarding house. The boarding house is cheaper and electricity is included. Rent savings: $\$350 - \$120 = \$230$/wk.

Electricity savings: $\$580$/quarter.

Communicate coherent and concise organisation of the response, appropriate to the genre

Sell the car and use public transport. Although public transport will be a new cost, it will only be $9.36/week (see Appendix 2). The savings in the first year are listed below, and greater savings will be made in the following years due to increased costs for these items.

1. No car payments, saving $120/week.
2. No petrol needed, saving $40/week.
3. No car servicing, saving $120 every 6 months.
4. No car insurance, saving $310 every 6 months.

These calculations are included in the budget in Appendix 5.

5.3 Excess currency

At the end of the trip there may be some Japanese currency unspent. It is assumed that the amount remaining will be 10% of the amount originally budgeted for.

Evaluate and verify justification of decisions made using mathematical reasoning

$$¥121\,623.46 \times 10\% = ¥12\,162.346$$

The exchange rate has changed from the start of the trip to when they returned to Australia. See Appendix 4.

5.3.1 Converting remaining yen back to Australian dollars

$$12\,162.346 \times 0.011 = 133.79$$

Remaining Japanese yen converted back to Australian dollars would be $133.79.

Evaluate and verify evaluation of the reasonableness of solutions by considering the results, assumptions and observations

5.4 Amount required to save for trip

The original budgeted amount required was $5750.

With the new budget, outlined below, they will have saved $7052.71, prior to the Tokyo games, which is more than they need. Therefore, they can now afford the trip.

Unit 1 Budget

Evaluate and verify

Years 2017 - 2020	Half year July-Dec 2017	Whole year Jan-Dec 2018	Whole year Jan-Dec2019	Half year Jan-June 2020	Total
Income					
Income - no tax (increasing by 3%p.a.)	$ 15,267.46	$ 31,450.97	$ 32,394.50	$ 16,683.17	$ 95,796.09
Expenses					
Food ($130/w, increasing by 5% annually)	$ 3,380.00	$ 7,098.00	$ 7,807.80	$ 4,294.29	$ 22,580.09
Electricity (included in board costs)	$ -	$ -	$ -	$ -	$ -
Biannual Insurance (no car, new accomod)	$ -	$ -	$ -	$ -	$ -
Rent in boarding house($120/w,up 5% p.a.)	$ 3,120.00	$ 6,552.00	$ 7,207.20	$ 3,963.96	$ 20,843.16
Car Loan Payments ($120/week, constant)	$ -	$ -	$ -	$ -	$ -
Clothing/Shoes ($75/m, up 10% p.a.)	$ 450.00	$ 990.00	$ 1,089.00	$ 598.95	$ 3,127.95
Entertainment ($110/w, constant)	$ 2,860.00	$ 5,720.00	$ 5,720.00	$ 2,860.00	$ 17,160.00
Medical Expenses ($80/w, up 15% p.a.)	$ 2,080.00	$ 4,784.00	$ 5,501.60	$ 3,163.42	$ 15,529.02
Petrol (sold car, no petrol required)	$ -	$ -	$ -	$ -	$ -
Car Servicing (sold car)	$ -	$ -	$ -	$ -	$ -
Telephone Bill ($50/m over 4yrs)	$ 300.00	$ 600.00	$ 600.00	$ 300.00	$ 1,800.00
Miscellaneous ($40/week, constant)	$ 1,040.00	$ 2,080.00	$ 2,080.00	$ 1,040.00	$ 6,240.00
Public transport ($9.36/week)	$ 243.36	$ 486.72	$ 486.72	$ 243.36	$ 1,460.16
Total Expenses	$ 13,473.36	$ 28,310.72	$ 30,492.32	$ 16,463.98	$ 88,740.38
Bank Balance (Start of Year)	$ 20.00	$ 1,814.10	$ 4,954.35	$ 6,856.52	
Surplus/Deficit	$ 1,794.10	$ 3,140.25	$ 1,902.18	$ 219.19	$ 7,055.71
Bank Balance (End of Year)	$ 1,814.10	$ 4,954.35	$ 6,856.52	$ 7,075.71	
Savings	$ 1,814.10	$ 4,954.35	$ 6,856.52	$ 7,075.71	$ 7,075.71
Percentage of Income	12%	10%	6%	1%	7%

Communicate correct use of technical vocabulary and conventions to develop the response, appropriate to the genre

See Appendix 5 for budget formula spreadsheet.

Communicate coherent and concise organisation of the response, including a suitable introduction, body and conclusion, which can be read independently of the task sheet

6 Conclusion

In the original budget, the spectator could not afford to attend the Paralympics. By making some lifestyle changes they can now afford the trip.

The new budget results in savings of $7052.71.

The spectator needs $5750 to fund the trip. Therefore, they can now afford the trip. The budget takes into consideration likely price increases due to inflation but also includes reduced spending on non-essential items.

6.1 Recommendations

Further recommendations regarding the budget would be to include the Consumer Price Index (CPI). Some calculations have included increased costs due to inflation; however, a standard increase due to the CPI would more thoroughly cover predicted costs.

7 Appendixes

Appendix 1

Airfare for 24 August (Brisbane–Singapore–Tokyo)

DEPARTING	ARRIVING	FLIGHT
FLIGHT 1 **Brisbane** Friday, 25 Aug 2017 **2:30 PM** Terminal I	**Singapore** Saturday, 25 Aug 2017 **8:45 AM**	**SQ 236** Singapore Airlines ECONOMY

▼ Add-ons

BAGGAGE

Passenger 1
Adult

30Kg checked

DEPARTING	ARRIVING	FLIGHT
FLIGHT 2 **Singapore** Saturday, 26 Aug 2017 **8:00 AM** Terminal 3	**Tokyo (Haneda Airport)** Saturday, 26 Aug 2017 **3:55 PM**	**SQ 632** Singapore Airlines ECONOMY

Airfare for 7 September (Tokyo–Singapore–Brisbane)

DEPARTING	ARRIVING	FLIGHT
FLIGHT 3 **Tokyo (Haneda Airport)** Wednesday, 06 Sep 2017 **9:15 AM** Terminal I	**Singapore** Wednesday, 06 Sep 2017 **3:15 PM**	**SQ 631** Singapore Airlines ECONOMY

▼ Add-ons

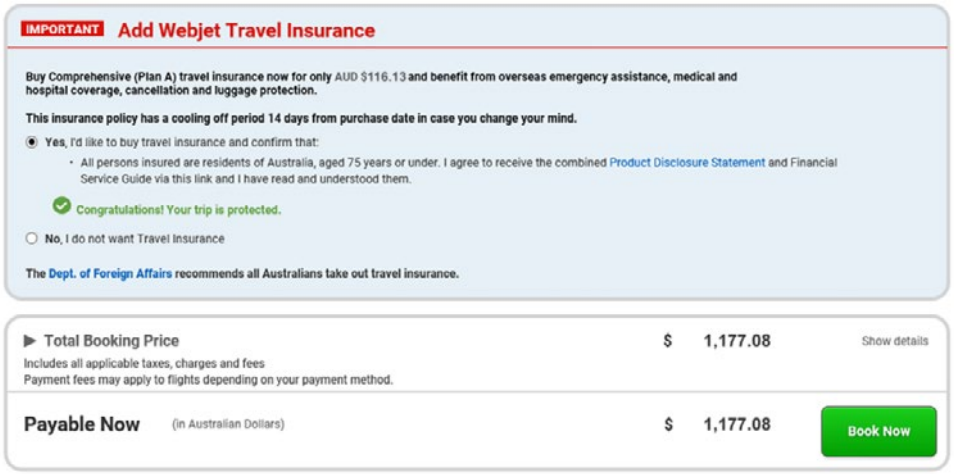
BAGGAGE

Passenger 1
Adult

30Kg checked

DEPARTING	ARRIVING	FLIGHT
FLIGHT 4 **Singapore** Thursday, 07 Sep 2017 **12:45 AM** Terminal 3	**Brisbane** Friday, 07 Sep 2017 **10:35 AM**	**SQ 255** Singapore Airlines ECONOMY

Travel insurance and total airfare cost



Information gathered on 20 March 2017 from www.webjet.com.

Appendix 2

South East Queensland *go* card fees.

Concession

Zones travelled	*go* card	*go* card off-peak	Single paper ticket
1	$1.60	$1.28	$2.30
2	$1.95	$1.56	$2.80
3	$2.98	$2.38	$4.30
4	$3.93	$3.14	$5.70
5	$5.16	$4.13	$7.50
6	$6.55	$5.24	$9.50
7	$8.14	$6.51	$11.80
8	$9.66	$7.73	$14.00

Weekly transport costs:

Off peak, 2 zones, 3 days/week

($1.56 x 2) x 3 = **$9.36/week**

Information gathered on 20 March 2017 from www.translink.com.au/tickets-and-fares/fares-and-zones/current-fares.

Appendix 3

Information gathered on 20 March 2017 from www.xe.com/currencyconverter/convert/?Amount=1&From=AUD&To=JPY.

Appendix 4

Information gathered on 20 March 2017 from www.bing.com/search?q=japanese+yen+to+australain+dollars&src=IE-SearchBox&FORM=IENTSR.

Appendix 5

Unit 1 Budget

Solve with formulas		Whole year	Whole year	Half year	
Years 2017 - 2020	Half year	Jan-Dec 2018	Jan-Dec2019	Jan-June 2020	Total
	July-Dec 2017				
Income					
Income - no tax (increasing by 3%p.a.)	=((808.3+65.9+14.1+130.6)+155.52)*26/2	=B5*2*1.03	=C5*1.03	=D5*1.03/2	=SUM(B5:E5)
Expenses					
Food ($130/w, increasing by 5% annually)	=130*(52/12)*6	=130*(52/12)*12*1.05	=C8*1.1	=D8*1.1/2	=SUM(B8:E8)
Electricity ($580/quarter, up 10% p.a.)	=580*4/2	=580*4*1.1	=C9*1.1	=D9*1.1/2	=SUM(B9:E9)
Biannual Insurance ($310, up 10% pa)	=620/2	=B10*2*1.1	=C10*1.1	=D10*1.1/2	=SUM(B10:E10)
Rent Payments ($350/week, up by 5% p.a.)	=350*26	=B11*2*1.05	=C11*1.1	=D11*1.1/2	=SUM(B11:E11)
Car Loan Payments ($120/week, constant)	=120*26	=B12*2	=B12*2	=B12	=SUM(B12:E12)
Clothing/Shoes ($150/m, up 10% p.a.)	=150*6	=B13*1.1*2	=C13*1.1	=D13*1.1/2	=SUM(B13:E13)
Entertainment ($220/w, constant)	=220*26	=B14*2	=C14	=B14	=SUM(B14:E14)
Medical Expenses ($80/w, up 15% p.a.)	=80*26	=B15*2*1.15	=C15*1.15	=D15*1.15/2	=SUM(B15:E15)
Petrol ($40/week, increasing by 5% p.a.)	=40*26	=B16*2*1.05	=C16*1.05	=D16*1.05/2	=SUM(B16:E16)
Car Servicing ($120, twice a year, constant)	=120	=B17*2	=B17*2	=B17	=SUM(B17:E17)
Telephone Bill ($50/m 2yr plan, $60/m 2yr)	=50*6	=B18*2	=60*12	=D18/2	=SUM(B18:E18)
Miscellaneous ($50/week, constant)	=50*26	=B19*2	=B19*2	=B19	=SUM(B19:E19)
Total Expenses	=SUM(B8:B19)	=SUM(C8:C19)	=SUM(D8:D19)	=SUM(E8:E19)	=SUM(B21:E21)
Bank Balance (Start of Year)	20	=B25	=C25	=D25	
Surplus/Deficit	=B5-B21	=C5-C21	=D5-D21	=E5-E21	=SUM(F5-F21)
Bank Balance (End of Year)	=B24+B23	=C24+C23	=D24+D23	=E24+E23	
Savings	=B23+B24	=B26+C24	=C26+D24	=D26+E24	=E26
Percentage of Income	=B24/B5	=C24/C5	=D24/D5	=E24/E5	=F24/F5

Unit 1		Budget			
Evaluate and verify					
Years 2017 - 2020	Half year	Whole year	Whole year	Half year	
	July-Dec 2017	Jan-Dec 2018	Jan-Dec2019	Jan-June 2020	Total
Income					
Income - no tax (increasing by 3%p.a.)	=((808.3+65.9+14.1+130.6)+155.5	=B5*2*1.03	=C5*1.03	=D5*1.03/2	=SUM(B5:E
Expenses					
Food ($130/w, increasing by 5% annually)	=130*(52/12)*6	=130*(52/12)*12*1.05	=C8*1.1	=D8*1.1/2	=SUM(B8:E
Electricity (included in board costs)	=580*4/2*0	=580*4*1.1*0	=C9*1.1	=D9*1.1/2	=SUM(B9:E
Biannual Insurance (no car, new accomod)	=620/2*0	=B10*2*1.1	=C10*1.1	=D10*1.1/2	=SUM(B10
Rent in boarding house($120/w,up 5% p.a.)	=(350-350+120)*26	=B11*2*1.05	=C11*1.1	=D11*1.1/2	=SUM(B11
Car Loan Payments ($120/week, constant)	=120*26*0	=B12*2	=B12*2	=B12	=SUM(B12
Clothing/Shoes ($75/m, up 10% p.a.)	=(150/2)*6	=B13*1.1*2	=C13*1.1	=D13*1.1/2	=SUM(B13
Entertainment ($110/w, constant)	=220*26/2	=B14*2	=C14	=B14	=SUM(B14
Medical Expenses ($80/w, up 15% p.a.)	=80*26	=B15*2*1.15	=C15*1.15	=D15*1.15/2	=SUM(B15
Petrol (sold car, no petrol required)	=40*26*0	=B16*2*1.05	=C16*1.05	=D16*1.05/2	=SUM(B16
Car Servicing (sold car)	=120*0	=B17*2	=B17*2	=B17	=SUM(B17
Telephone Bill ($50/m over 4yrs)	=50*6	=B18*2	=50*12	=D18/2	=SUM(B18
Miscellaneous ($40/week, constant)	=40*26	=B19*2	=B19*2	=B19	=SUM(B19
Public transport ($9.36/week)	=9.36*26	=B20*2	=B20*2	=B20	=SUM(B20
Total Expenses	=SUM(B8:B20)	=SUM(C8:C20)	=SUM(D8:D20)	=SUM(E8:E20)	=SUM(B23
Bank Balance (Start of Year)	20	=B27	=C27	=D27	
Surplus/Deficit	=B5-B23	=C5-C23	=D5-D23	=E5-E23	=SUM(F5-F
Bank Balance (End of Year)	=B26+B25	=C26+C25	=D26+D25	=E26+E25	
Savings	=B25+B26	=B28+C26	=C28+D26	=D28+E26	=E28
Percentage of Income	=B26/B5	=C26/C5	=D26/D5	=E26/E5	=F26/F5

Appendix 6

8 Reference list

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